A Revolution in Savings: The Impact of M-PESA on Savings Patterns in Kenya

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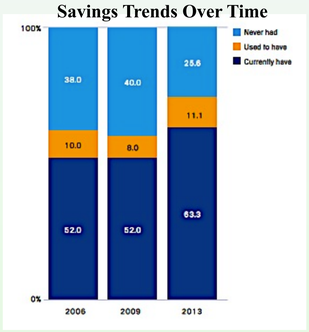
Introduction

M-PESA is a mobile money program launched in 2007 by Safaricom, the largest telecommunications company in Kenya. This program allows individuals to send and receive money over great distances at a low rate, safely store value, and even pay bills and receive paychecks. Since its inception, M-PESA has become one of the most important economic forces in Kenya; so much so that in 2013, 31% of Kenyan GDP was spent over M-PESA.

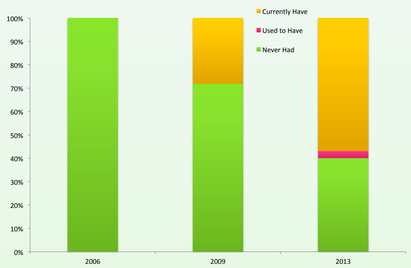
The Economic Impact of M-PESA

M-PESA Usage and Savings Rates Over Time

Savings Trends Over Time

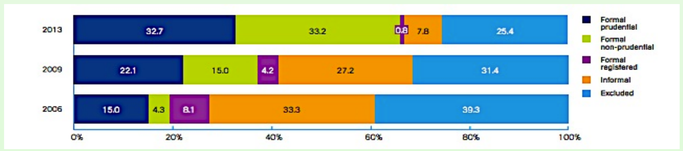


Mobile Money Account Ownership Over Time



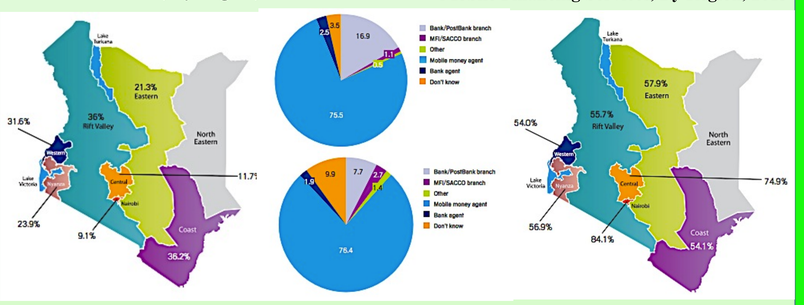
M-PESA and Financial Exclusion

Financial Exclusion Over Time



Financial Exclusion, By Region, 2013

Mobile Financing Services, By Region, 2013



Nearest Financial Service Provider, Urban (Up) and Rural (Down), 2013

M-PESA has introduced financial options to populations that were previously excluded and has led to a revolution in "banking the unbanked." The effects of M-PESA in "banking the unbanked" serve as my primary research impetus. Specifically, I am interested in how this program has affected how people save.

Questions of Interest

1. How has M-PESA affected overall savings levels?
2. Has M-PESA led to the crowding out of other methods of savings? These methods include savings under the bed, informally, in a SACCO, in a ROSCA, and in a bank.
3. Has M-PESA led to an increase in individualized savings, or, in the same vein, a decrease in group savings?

Data

FinAccess Surveys

Information:

- Collected by the Financial Sector Deepening Kenya
- Purpose of collection: to assess the financial landscape, savings patterns, and financial product usage of the Kenyan populace
- Three survey years – 2006, 2009, 2013
- Sample is nationally representative in each survey year, though not panel
- 17,465 individuals surveyed in total

Methods and Models

I use a 2SLS-LPM in order to control for the endogeneity of M-PESA usage.

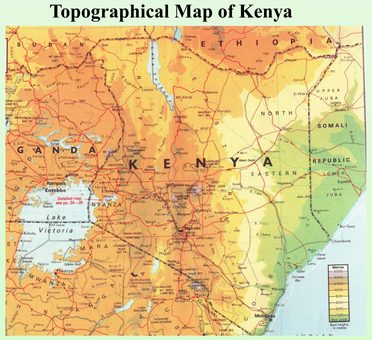
Instrument

Elevation Demeaned at the Regional Level

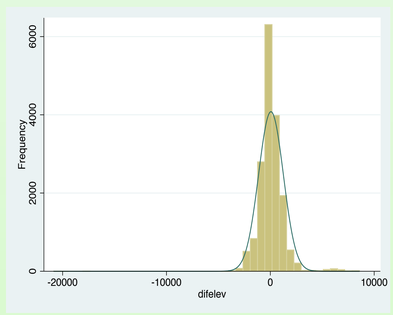
Why?

- Takes advantage of the fact that cell phone signal is dependent on elevation
  - A person at a lower elevation is more likely to have his or her cell phone signal blocked or obstructed than someone at a high elevation
  - Can't use M-PESA without cell phone signal
- Unlikely to be correlated with error, as elevation is independent of human action
- I choose to demean elevation at the regional elevation to:
  - normalize the distribution of the instrument
  - reduce correlation with other regressors
  - remove underlying regional trends
- The data for elevation comes from the FinAccess surveys and GPSvisualiser.com together

Topographical Map of Kenya



Distribution of Demeaned Elevation



Stage 1 Model:

$$mpesa_{it} = \beta_0 + \pi difelev_{it} + \theta Period_{it} + \alpha X_{it} + \nu_{it}$$

- *mpesa* – dummy variable taking the value of 1 if the person uses M-PESA and 0 otherwise
- *difelev* – individual elevation demeaned at the regional level
- *X* - a set of control variables
- *Period* - a dummy for the survey year in which the data was collected

Stage 2 Models:

$$savings_{it} = \beta_0 + \beta_1 mpesa_{it} + \alpha X_{it} + \theta Period_{it} + \varepsilon_{it}$$
$$Y_{itj} = \beta_0 + \beta_1 mpesa_{itj} + \alpha X_{itj} + \theta Period_{itj} + \varepsilon_{itj}$$
$$groupsavings_{it} = \beta_0 + \beta_1 mpesa_{it} + \alpha X_{it} + \theta Period_{it} + \varepsilon_{it}$$

- *mpesa* – determined by stage 1 regression
- *X* and *Period* – the same as above
- *savings* – a binary variable taking the value of 1 if a respondent answered "yes" to the question "Do you currently have a savings product?" and taking a value of 0 otherwise
- Y_j – represents one of 5 variables: *savsac, savros, savinf, savbank, underbed*. Each of these is a binary variable taking the value of 1 if a respondent answered "yes" to the question "Do you save with a SACCO, a ROSCA, informally, a Bank, or under the bed?," respectively, and taking a value of 0 otherwise
- *groupsavings* - a binary variable taking the value of 1 if a respondent answered "yes" to the question "Do you save with a group?" and taking a value of 0 otherwise

Results and Discussion

VARIABLES	(1) Savings	(2) Under the Bed	(3) Informal Savings	(4) SACCO Saving	(5) ROSCA Saving	(6) Bank Saving	(7) Group Savings
mpesa	0.991***	-0.175	0.426**	0.949***	0.477	0.461**	0.551*
	(0.356)	(0.322)	(0.196)	(0.299)	(0.306)	(0.228)	(0.331)
age	0.00166***	-0.00213***	-0.000159	0.00342***	0.000177	0.00213***	0.00113***
	(0.000313)	(0.000283)	(0.000173)	(0.000263)	(0.000269)	(0.000201)	(0.000291)
education	-0.00637	0.00696	-0.0246*	-0.0206	-0.0113	0.0593***	-0.00579
	(0.0251)	(0.0226)	(0.0138)	(0.0211)	(0.0215)	(0.0160)	(0.0233)
female	0.0243	0.0136	0.0123	-0.0267**	0.136***	-0.0482***	0.126***
	(0.0155)	(0.0140)	(0.00854)	(0.0130)	(0.0133)	(0.00993)	(0.0144)
married	0.0328**	0.00390	-0.0183**	-0.00176	0.0739***	-0.00234	0.0862***
	(0.0157)	(0.0142)	(0.00866)	(0.0132)	(0.0135)	(0.0101)	(0.0146)
urban	-0.105**	0.00788	-0.0374	-0.146***	-0.0778**	0.0261	-0.107***
	(0.0423)	(0.0382)	(0.0233)	(0.0356)	(0.0364)	(0.0271)	(0.0393)
y09	-0.100	0.333***	-0.108*	-0.321***	-0.0646	-0.0736	-0.108
	(0.103)	(0.0927)	(0.0565)	(0.0863)	(0.0882)	(0.0657)	(0.0954)
y13	-0.612***	0.147	-0.258**	-0.591***	-0.359*	-0.270*	-0.354*
	(0.230)	(0.207)	(0.127)	(0.193)	(0.198)	(0.147)	(0.214)
Constant	0.605***	0.325***	0.156***	0.118	0.221***	-0.103*	0.265***
	(0.0883)	(0.0797)	(0.0486)	(0.0741)	(0.0758)	(0.0565)	(0.0820)
Observations	17,117	17,117	17,117	17,117	17,117	17,117	17,117
R-squared		0.042				0.124	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

*First stage regression available upon request. *Robustness checks available upon request.

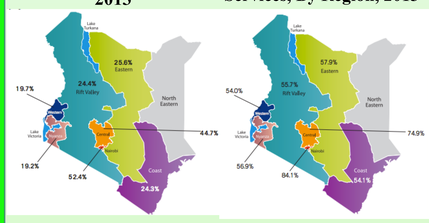
*Summary statistics available upon request.

Discussion

- M-PESA usage has a huge and significant impact on likelihood of saving.

Bank Usage, By Region, 2013

Mobile Financing Services, By Region, 2013



- M-PESA crowds in other methods of savings, including formal, semi-formal, and informal.
- M-PESA introduces people to savings
- People save informally if that's their only or most convenient option and semi-formally or formally if they have ability
- M-PESA helps to formalize savings
  - Seen on maps to the left
- M-PESA crowds out savings under the bed
  - However, insignificant

- M-PESA leads people away from individualized savings towards group savings
  - However, only marginally significant
  - People save more with M-PESA, and groups are well-established and have community knowledge – thus people begin to save with groups as it is easy
  - Further into the future, people may begin to save more individually due to M-PESA as they become accustomed to savings and comfortable saving alone

Directions for Further Research

- Collection of a proper data set examining the effects of M-PESA on the individualization of savings
  - Will hopefully lead to more meaningful and significant results
- Examination of the ability of an individual to hide savings on M-PESA
  - Can use same data set – individualization and hiding go together

Acknowledgements

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References

A full list of references and related works is available upon request.